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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,089	09/10/2003	Lee Jen Chen	MXIC-P910270	6595

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EXAMINER

HOANG, QUOC DINH

ART UNIT PAPER NUMBER

2818

DATE MAILED: 06/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/661,089	Applicant(s) CHEN ET AL. (me)	
	Examiner Quoc D. Hoang	Art Unit 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-17 is/are rejected.
- 7) ☒ Claim(s) 3-5, 7-9 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Amendment filed 05/02/2005 has been entered. In the Amendment, claims 2 and 18-24 have been canceled. Claims 1 and 3-17 are pending in the application.

Applicants' remarks have been considered.

Allowable Subject Matter

2. The indicated allowability of claims 1, 3-5, 7, 9 and 10 are withdrawn in view of the newly discovered reference(s) to Frankel (U.S. Pat No. 5,968,587). Rejections based on the newly cited reference(s) follow.

Claim Objections

3. Claims 3-5, 7-9 and 10 are objected to because of the following informalities:

In claim 3, is that a different between "a phosphosilicate glass layer" in line 4 and "a glass layer " in line 2. If not, the term "a glass layer" in line 2 should be --the phosphosilicate glass layer--, and the term "the glass layer" in line 5 should be --the phosphosilicate glass layer--.

In claim 4, is that a different between "a glass layer" in line 4 and "a glass layer " in line 2. If not, the term "a glass layer" in line 4 should be --the glass layer --.

In claim 5, is that a different between "a glass layer" in line 3 and "a glass layer " in line 2. If not, the term "a glass layer" in line 3 should be --the glass layer --.

In claim 7, is that a different between "a glass layer" in line 4 and "a glass layer " in line 3. If not, the term "a glass layer" in line 4 should be --the glass layer --.

In claim 8, line 1, the term "a cap oxide layer" in line 1 should be --the cap oxide layer --.

In claim 9, is that a different between "a glass layer" in line 3 and "a glass layer " in line 2. If not, the term "a glass layer" in line 3 should be --the glass layer --.

In claim 10, is that a different between "a glass layer" in line 3 and "a glass layer " in line 2. If not, the term "a glass layer" in line 3 should be --the glass layer --.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 and 3-17, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Frankel (U.S. Pat No. 5,968,587).

Regarding claim 1, Frankel teaches a method comprising forming an oxide cap 1030 upon a phosphosilicate glass layer 1008 via a chemical vapor deposition process (col. 40, lines 51 through col. 43 line 10 and Fig. 19A and Fig. 19D).

The limitation that the method is “for mitigating defect formation” has not been given patentable weight because it has been held that a preamble in denied the effect of a limitation where the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951).

Regarding claim 3, Frankel teaches a method comprising:

forming a phosphosilicate glass layer 1008 upon a substrate 1004 (col. 40, lines 51 through col. 43 line 10 and Fig. 19A); and

forming an oxide cap 1030 upon the phosphosilicate glass layer 1008 (col. 40, lines 51 through col. 43 line 10 and Fig. 19D).

The limitation that the method is “for mitigating defect formation” has not been given patentable weight because it has been held that a preamble in denied the effect of a limitation where the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951).

Regarding claim 4, Frankel teaches a method comprising:

forming a glass layer 1008 upon a silicon substrate 1004 (col. 40, lines 51 through col. 43 line 10 and Fig. 19A); and

forming an oxide cap 1030 upon the glass layer 1008 (col. 40, lines 51 through col. 43 line 10 and Fig. 19D).

The limitation that the method is “for mitigating defect formation” has not been given patentable weight because it has been held that a preamble in denied the effect of a limitation where the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951).

Regarding claim 5, Frankel teaches a method comprising:

forming a glass layer 1008 upon a substrate 1004 having at least one semiconductor layer formed thereon (col. 40, lines 51 through col. 43 line 10 and Fig. 19A); and

forming a cap oxide 1030 upon the glass layer 1008 (col. 40, lines 51 through col. 43 line 10 and Fig. 19D).

The limitation that the method is “for mitigating defect formation” has not been given patentable weight because it has been held that a preamble in denied the effect of a limitation where the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951).

Regarding claim 6, Frankel teaches forming an oxide cap layer 1030 upon the phosphosilicate glass layer 1008 comprising forming the cap oxide layer 1030 via a chemical vapor deposition process (col. 52, lines 20).

Regarding claim 7, Frankel teaches a method comprising:

forming a glass layer 1008 upon a substrate 1004 via a first chemical vapor deposition process (col. 40, lines 51 through col. 43 line 10 and Fig. 19A); and

forming a cap oxide 1030 upon the glass layer 1008 via a second chemical vapor deposition process, wherein a “reactor” chamber 15 within which the first and second chemical vapor deposition processes are performed is not broken between the first and second chemical vapor deposition processes (col. 40, lines 51 through col. 43 line 10 and Fig. 19A and Fig. 19D).

The limitation the method is “for mitigating defect formation” has not been given patentable weight because it has been held that a preamble in denied the effect of a limitation where the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951).

Regarding claim 8, Frankel teaches wherein forming the cap oxide layer 1030 comprises forming an undoped oxide layer (USG or undoped silicate glass) 1030 upon the glass layer 1008 (col. 42, line 38).

Regarding claim 9, Frankel teaches a method comprising:

forming a glass layer 1008 upon a substrate 1004 (col. 40, lines 51 through col. 43 line 10 and Fig. 19A); and

forming a cap oxide 1030 upon the glass layer 1008, the forming of a cap oxide layer comprising forming an undoped oxide layer (USG) 1030 upon a P-doped oxide film (PSG) 1008 (col. 40, lines 51 through col. 43 line 10 and Fig. 19D).

The limitation that “for mitigating defect formation in a glass layer of a semiconductor device” has not been given patentable weight because it has been held that a preamble in denied the effect of a limitation where the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951).

Regarding claim 10, Frankel teaches a method comprising:

forming a glass layer 1008 upon a substrate 1004 (col. 40, lines 51 through col. 43 line 10 and Fig. 19A); and

forming a cap oxide 1030 upon the glass layer 1008, wherein the glass layer (PSG) 1008 is formed by a process selected from the group consisting of a plasma enhanced chemical vapor deposition process (PECVD) and an sub-atmospheric chemical vapor deposition process (SACVD) (col. 40, lines 51 through col. 43 line 10, col. 47, lines 3-40 and Fig. 19D).

The limitation that the method is for mitigating defect formation has not been given patentable weight because it has been held that a preamble in denied the effect of a limitation where the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951).

Regarding claim 11, Frankel teaches wherein the cap oxide layer 1030 is formed to have a thickness between about 50-500 Angstroms, but fails to teach wherein the cap oxide layer 1030 having a thickness greater than 300 Angstroms (col. 52, line 5). However, although Frankel's cap oxide layer thickness(50-500 Angstroms) is not in the claimed range (greater than 300 Angstroms), this does not define patentable over Frankel since the thickness is well known processing variable and the discovery of the optimum or workable range involves only routine skill in the art.

Regarding claim 12, Frankel teaches wherein a phosphorus blocking capability of the cap oxide layer is between about 2-8 wt% phosphorus, but fails to teach wherein a phosphorus blocking capability of the cap oxide layer is at least 11% by weight (col. 66, lines 49-51). However, although Frankel's wt % of phosphorus (2-8 wt% phosphorus) is not in the claimed range (11wt% phosphorus), this does not define patentable over Frankel since the concentration of phosphorus in the phosphosilicate glass layer is well known processing variable and the discovery of the optimum or workable range involves only routine skill in the art.

Regarding claim 13, Frankel teaches wherein the cap oxide layer (USG) 1030 is formed by SiH_4 and N_2O reacting gases (col. 50, lines 45-46).

Regarding claim 14, Frankel teaches wherein the cap oxide layer (USG) 1030 is formed by TEOS and O_2 reacting gases (col. 51, lines 40-45).

Regarding claim 15, Frankel teaches wherein the cap oxide layer 1030 process temperature is between approximately 350°C and approximately 600°C (col. 51, line 32).

Regarding claim 16, Frankel teaches wherein the glass layer 1008 process temperature is between approximately 450°C and approximately 650°C (col. 50, line 34).

Regarding claim 17, Frankel teaches wherein forming the cap oxide layer 1030 comprises forming inter-metal dielectric layers (IMD) (col. 50, lines 22-23).

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quoc Hoang whose telephone number is (571) 272-1780. The examiner can normally be reached on Monday-Friday from 8.00 AM to 5.00 PM.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone numbers of the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Quoc Hoang

Patent examiner/AU 2818

Quoc Hoang
6/17/2005